DNA sequence:

ccttcatgtcttttgtagaaaccccattatctttcttagggcccaattgaaaacccacattttctttcacctaacccac
caaagccttgcacatgttgacgtgaacaccaaactaacacgtgtcatactgccagtggttatgataaatgctcataccat
accagagtcatagagtttttggttggtgaaagatttgacggatgccttcttctcatttctcaccaactccctccaaaccc
aacaaaatgtttatattagcaaagccgccaaagtgtaaacgaaagtttataaatttcatttctgtgatcttacgtaattg
gaggaagatcaaaatttttcaatccccattcttcgattgcttcaattgaagtttctccg

[transit peptide start]

ATGGCGCAAGTTAGCAGAATCTGCAATGGTGTGCAGAACCCATCTCTTATCTCCAATCTCTCGAAATCCAGTCAACGCAA
ATCTCCCTTATCGGTTTCTCTGAAGACGCAGCAGCATCCACGAGCTTATCCGATTTCGTCGTCGTGGGGATTGAAGAAGA
GTGGGATGACGTTAATTGGCTCTGAGCTTCGTCCTCTTAAGGTCATGTCTTCTGTTTCCACGGCGGAG

[mature peptide starts]

AAAGCGTCGGAGATTGTACTTCAACCCATTAGAGAAATCTCCGGTCTTATTAAGCTTCCTGGCTCCAAGTCTCTATCAAA
TCGGATCCTGCTTCTCGCTGCTCTGTCTGAGGTATATATCACTTCGTTTCGTCCTTCTCTGTAATCTGAACTTAGATTAT
AAAGATTGATACTTTACCATTTTGCTGTGGTTTTATAGGGAACAACTGTAGTGGACAACTTGTTGAATAGCGATGACATC
AATTACATGCTTGATGCGTTGAAGAGATTGGGACTTAATGTGGAAACTGACAGTGAAAATAATCGTGCTGTAGTTGAAGG
ATGTGGCGGGATATTCCCAGCTTCCATAGATTCAAAGAGTGATATCGAACTTTACCTCGGTAATGCAGGAACAGCAATGC
GTCCACTTACCGCTGCGGTCACTGCTGCAGGTGGAAACGCAAGGTAGATTGAAGGAGTTGATGCTTCTTGGTATTTGATG
TTTAAGGAATGGAGCTTTTGTTGATGCTTTATGATCCATTTATTCCAGTTATGTGCTTGATGGGGTGCCTCGTATGAGAG
AAAGACCTATAGGGGATTTGGTTGTTGGTCTTAAGCAGCTTGGTGCTGATGTTGAATGTACTCTTGGAACTAACTGCCCT
CCTGTTCGTGTCAACGCTAATGGTGGCCTTCCCGGTGGAAAGGTTAGATCTTGCAAATGGCATGTGAATATGTAATCTCG
TTCCTTACTCTATGAACACTTGCAGAAATGTGTGTTCATCATAGCCTTAGCTTGACAAGATTTCAGTTTTTAATCTACTC
TCAACGGATGGATCCTAAAATAGAATCGGATTTGGTGATTGGTTTTCGTTCTCGATTACCGTTTTCGTTGTATGATTTCT
TGATTAACAATTAGGAGACATGTTATGCATTTGCAGGTGAAGCTTTCTGGATCAATTAGTAGTCAGTACTTGACTGCTCT
GCTCATGTCTGCTCCCTTAGCTCTTGGAGACGTCGAGATTGAGATTGTCGATAAATTAATTTCTGTTCCATATGTTGAAA
TGACATTGAAGTTGATGGAACGTTTCGGGGTTAGTGTCGAGCATAGTGATAGCTGGGATCGTTTCTTTGTCAACGCCCCC
CAAAAATACAAGTAGGAGTTATTCTTTTCTTCCTTTTCTGAAATCACATCCCTTAGCTTGACAATATAATGACTAAAAGG
TGAATGATTCAGGTCTCCGGGTAATGCGTATGTAGAAGGTGATGCTTCTAGTGCATGTTATTTCTTGGCTGGTGCTGCCA
TTACCGGTGAAACTGTCACAGTCGAAGGTTGTGGAACTACCAGCTTGCAGGTAATATTTGTACACTGAATCATCGACGAG
GCTGTTAAGTTTATAGTGAAATTCGTCTAGGTCAAAGTTTCATCTTTTGACAAGTTGTATATAACATATTCGCAAGATTC
TAAGCTCAATTTTTGTGATGAATCTCTAGGGAGATGTAAAATTCGCCGAGGTCCTTGAGAAAATGGGATGTAAAGTGTCC
TGGACAGAGAACAGTGTGACTGTGACAGGACCACCTAGAGATGCTTTTGGAATGAGACACTTGCGGGCTATTGATGTCAA
CATGAACAAAATGCCTGATGTAGCCATGACCCTTGCCGTCGTTGCTCTCTTTGCTGACGGTCCAACCACCATTAGAGATG
GTAAGTAAAAAGCTCTCTCTTATAATTAAGGTTTCTCAATATTCATGATCACTTAATTCTGTTTGGTTAATATAGTGGCT
AGCTGGAGAGTAAAGGAGACAGAAAGGATGATTGCCATTTGCACAGAGCTTAGAAAAGTAAGAGATTCTTATCTCTCTCT
TTCTGTCTCTTGACAGTGCTCATTCTAAGTAATTAGCTCATAAATTTGTGTGTTTGTGTTCAGCTGGGAGCTACAGTGGA
AGAAGGTTCAGATTATTGTGTGATAACTCCGCCCAAAAAGGTGAAAACGGCAGAGATTGATACATATGATGATCATAGAA
TGGCAATGGCATTCTCTCTTGCAGCTTGTGCTGATGTTCCAATCACCATCAACGACTCTGGTTGCACCAGGAAAACCTTC
CCCGACTACTTCCAAGTACTTGAAAGAATCACAAAGCACTAAacaataaactctgttttttcttctgatccaagctt

FIG. 1A

Protein sequence:

MAQVSRICNGVQNPSLISNLSKSSQRKSPLSVSLKTQQHPRAYPISSSWGLKKSGMTLIGSELRPLKVMSSVSTAE
KASEIVLQPIREISGLIKLPGSKSLSNRILLLAALSEGTTVVDNLLNSDDINYMLDALKRLGLNVETDSENNRAVV
EGCGGIFPASIDSKSDIELYLGNAGTAMRPLTAAVTAAGGNASYVLDGVPRMRERPIGDLVVGLKQLGADVECTLG
TNCPPVRVNANGGLPGGKVKLSGSISSQYLTALLMSAPLALGDVEIEIVDKLISVPYVEMTLKLMERFGVSVEHSD
SWDRFFVKGGQKYKSPGNAYVEGDASSACYFLAGAAITGETVTVEGCGTTSLQGDVKFAEVLEKMGCKVSWTENSV
TVTGPPRDAFGMRHLRAIDVNMNKMPDVAMTLAVVALFADGPTTIRDVASWRVKETERMIAICTELRKLGATVEEG
SDYCVITPPKKVKTAEIDTYDDHRMAMAFSLAACADVPITINDSGCTRKTFPDYFQVLERITKH

FIG. 1B

**Arabidopsis thaliana wild type sequence:**

| Position | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *L* | *G* | *N* | *A* | ***G*** | ***T*** | *A* | *M* | *R* | ***P*** | *L* |
| | CTC | GGT | AAT | GCA | ***GGA*** | ***ACA*** | GCA | ATG | CGT | ***CCA*** | CTT |

**Arabidopsis thaliana mutant sequences:**

| Name | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $A_{177}$ | CTC | GGT | AAT | GCA | ***GCA*** | ACA | GCA | ATG | CGT | CCA | CTT |
| | *L* | *G* | *N* | *A* | ***A*** | *T* | *A* | *M* | *R* | *P* | *L* |
| $I_{178}$ | CTC | GGT | AAT | GCA | GGA | ***ATA*** | GCA | ATG | CGT | CCA | CTT |
| | *L* | *G* | *N* | *A* | *G* | ***I*** | *A* | *M* | *R* | *P* | *L* |
| $A_{177}I_{178}$ | CTC | GGT | AAT | GCA | ***GCA*** | ***ATA*** | GCA | ATG | CGT | CCA | CTT |
| | *L* | *G* | *N* | *A* | ***A*** | ***I*** | *A* | *M* | *R* | *P* | *L* |
| $I_{178}S_{182}$ | CTC | GGT | AAT | GCA | GGA | ***ATA*** | GCA | ATG | CGT | ***TCA*** | CTT |
| | *L* | *G* | *N* | *A* | *G* | ***I*** | *A* | *M* | *R* | ***S*** | *L* |
| $A_{177}S_{182}$ | CTC | GGT | AAT | GCA | ***GCA*** | ACA | GCA | ATG | CGT | ***TCA*** | CTT |
| | *L* | *G* | *N* | *A* | ***A*** | *T* | *A* | *M* | *R* | ***S*** | *L* |
| $A_{177}I_{178}S_{182}$ | CTC | GGT | AAT | GCA | ***GCA*** | ***ATA*** | GCA | ATG | CGT | ***TCA*** | CTT |
| | *L* | *G* | *N* | *A* | ***A*** | ***I*** | *A* | *M* | *R* | ***S*** | *L* |
| $V_{178}S_{182}$ | CTC | GGT | AAT | GCA | GGA | ***GTA*** | GCA | ATG | CGT | ***TCA*** | CTT |
| | *L* | *G* | *N* | *A* | *G* | ***V*** | *A* | *M* | *R* | ***S*** | *L* |
| $L_{178}S_{182}$ | CTC | GGT | AAT | GCA | GGA | ***TTA*** | GCA | ATG | CGT | ***TCA*** | CTT |
| | *L* | *G* | *N* | *A* | *G* | ***L*** | *A* | *M* | *R* | ***S*** | *L* |
| $A_{177}V_{178}$ | CTC | GGT | AAT | GCA | ***GCA*** | ***GTA*** | GCA | ATG | CGT | CCA | CTT |
| | *L* | *G* | *N* | *A* | ***A*** | ***V*** | *A* | *M* | *R* | *P* | *L* |
| $A_{177}L_{178}$ | CTC | GGT | AAT | GCA | ***GCA*** | ***TTA*** | GCA | ATG | CGT | CCA | CTT |
| | *L* | *G* | *N* | *A* | ***A*** | ***L*** | *A* | *M* | *R* | *P* | *L* |

FIG. 2

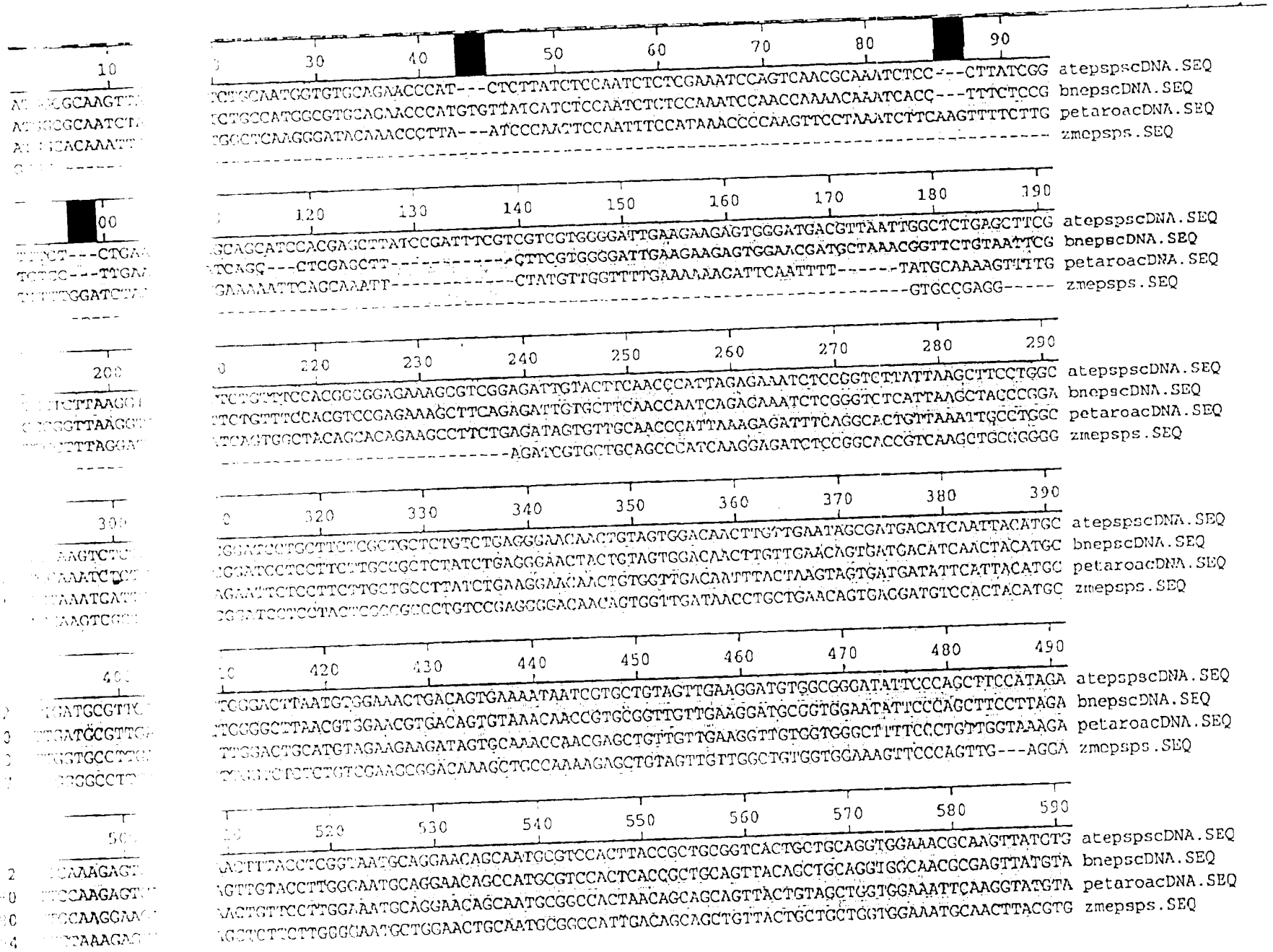
atepspscDNA.SEQ
bnepscDNA.SEQ
petaroacDNA.SEQ
zmepsps.SEQ

FIG. 3A

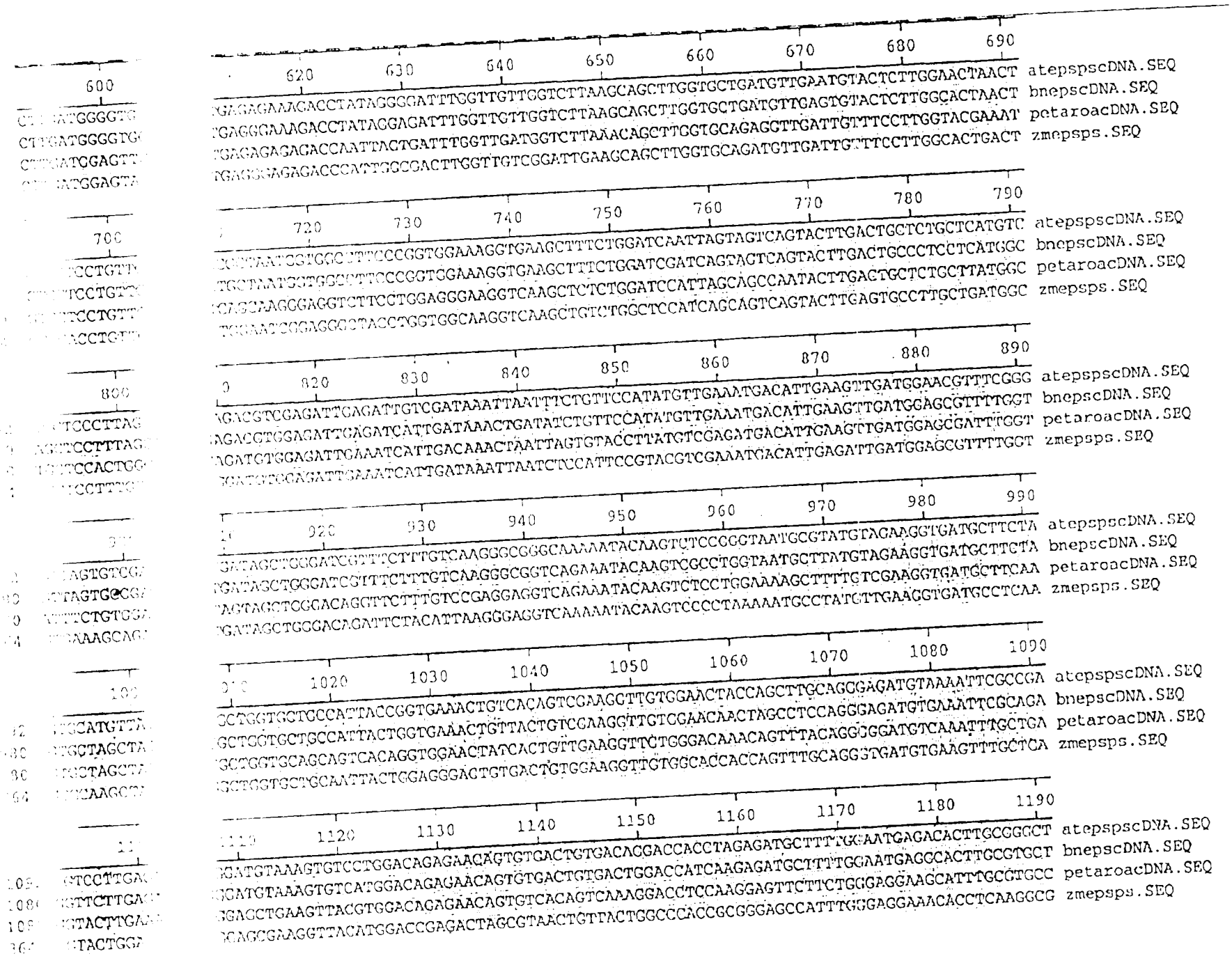
atepspscDNA.SEQ
bnepscDNA.SEQ
petaroacDNA.SEQ
zmepsps.SEQ

FIG. 3B

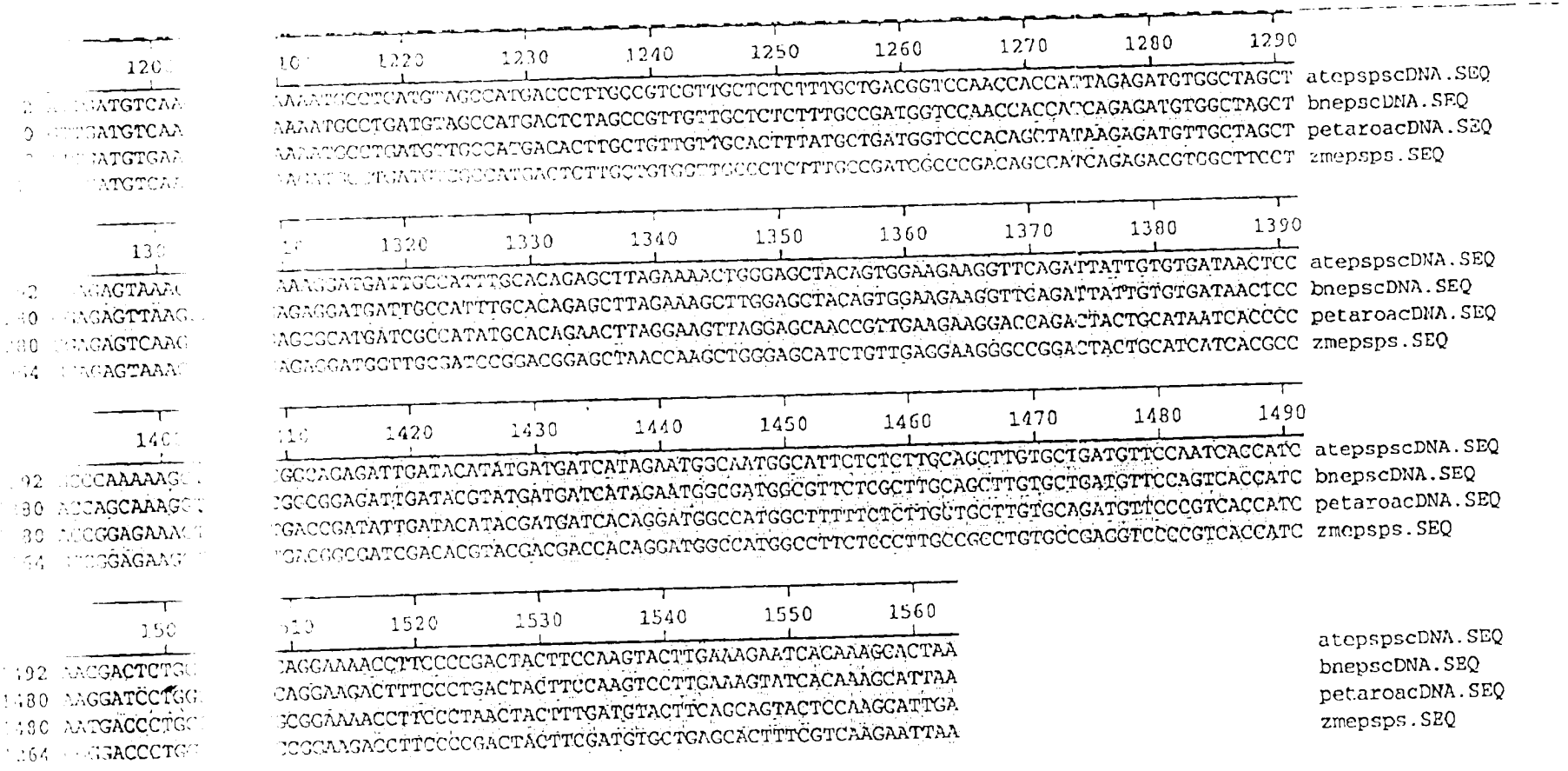
1220 1230 1240 1250 1260 1270 1280 1290
atepspscDNA.SEQ
bnepscDNA.SEQ
petaroacDNA.SEQ
zmepsps.SEQ
1320 1330 1340 1350 1360 1370 1380 1390
atepspscDNA.SEQ
bnepscDNA.SEQ
petaroacDNA.SEQ
zmepsps.SEQ
1420 1430 1440 1450 1460 1470 1480 1490
atepspscDNA.SEQ
bnepscDNA.SEQ
petaroacDNA.SEQ
zmepsps.SEQ
1520 1530 1540 1550 1560
atepspscDNA.SEQ
bnepscDNA.SEQ
petaroacDNA.SEQ
zmepsps.SEQ

FIG. 3C

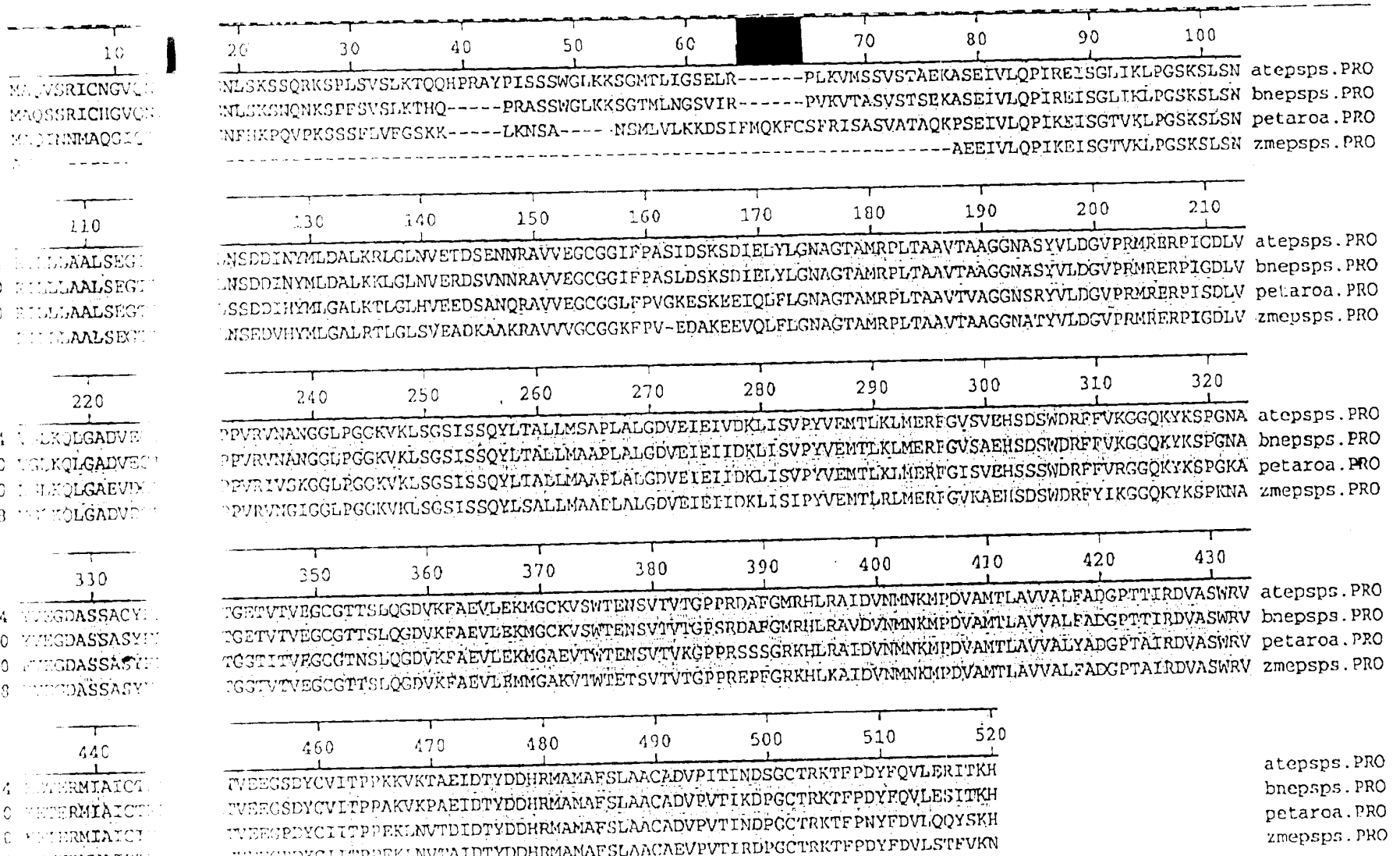


FIG. 4

| Oligo Name | Oligo Sequence (5'→3') |
|---|---|
| ATEPS-$A_{177}$ | CGTTTCCACCTGCAGCAGTGACCGCAGCGGTAAGTGGACGCATTGCTGTTGCTGCATTACCGAG |
| ATEPS-AI | CGTTTCCACCTGCAGCAGTGACCGCAGCGGTAAGTGGACGCATTGCTATTGCTGCATTACCGAG |
| ATEPS-IS | CGTTTCCACCTGCAGCAGTGACCGCAGCGGTAAGTGAACGCATTGCTATTCCTGCATTACCGAG |
| ATEPS-AS | CGTTTCCACCTGCAGCAGTGACCGCAGCGGTAAGTGAACGCATTGCTGTTGCTGCATTACCGAG |
| ATEPS-AIS | CGTTTCCACCTGCAGCAGTGACCGCAGCGGTAAGTGAACGCATTGCTATTGCTGCATTACCGAG |
| ATEPS-$I_{177}$ | CGTTTCCACCTGCAGCAGTGACCGCAGCGGTAAGTGGACGCATTGCTGTTATTGCATTACCGAG |
| ATEPS-VS | CGTTTCCACCTGCAGCAGTGACCGCAGCGGTAAGTGAACGCATTGCTACTCCTGCATTACCGAG |
| ATEPS-LS | CGTTTCCACCTGCAGCAGTGACCGCAGCGGTAAGTGAACGCATTGCTAATCCTGCATTACCGAG |
| ATEPS-AV | CGTTTCCACCTGCAGCAGTGACCGCAGCGGTAAGTGGACGCATTGCTACTGCTGCATTACCGAG |
| ATEPS-AL | CGTTTCCACCTGCAGCAGTGACCGCAGCGGTAAGTGGACGCATTGCTAATGCTGCATTACCGAG |

FIG. 5

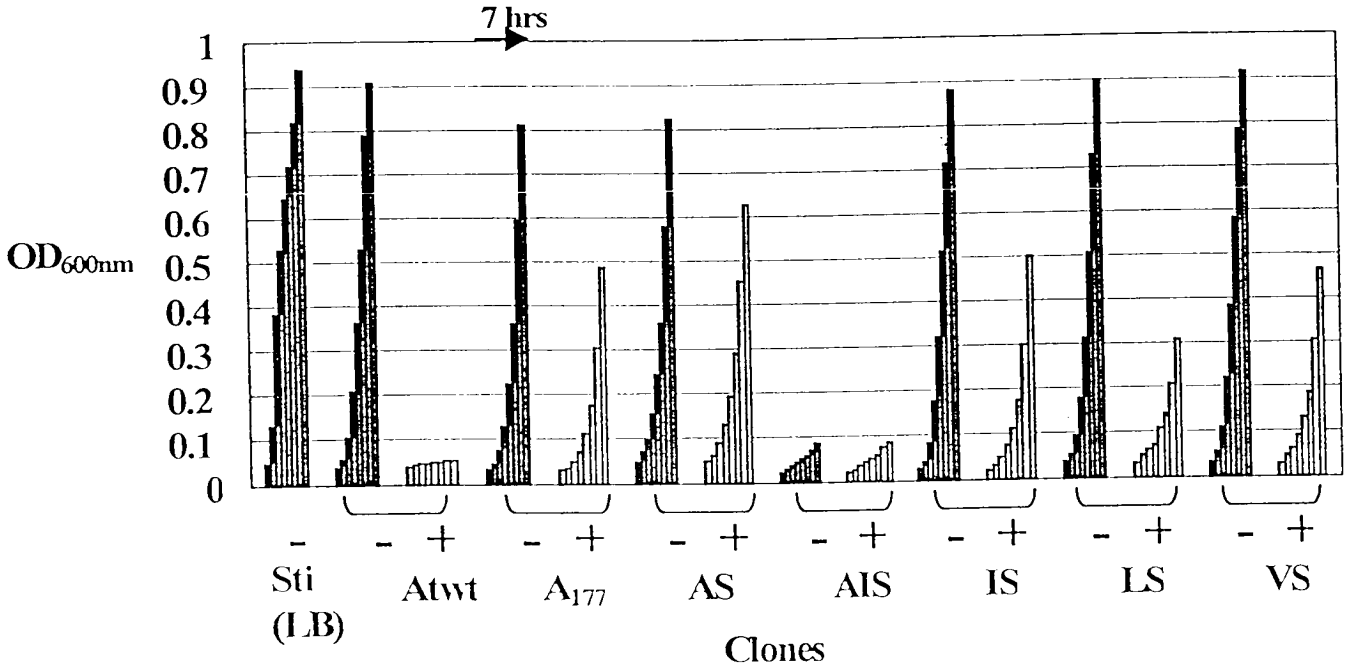
7 hrs
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
OD600nm
- - + - + - + - + - + - + - +
Sti (LB)
Atwt
A177
AS
AIS
IS
LS
VS
Clones

FIG. 6

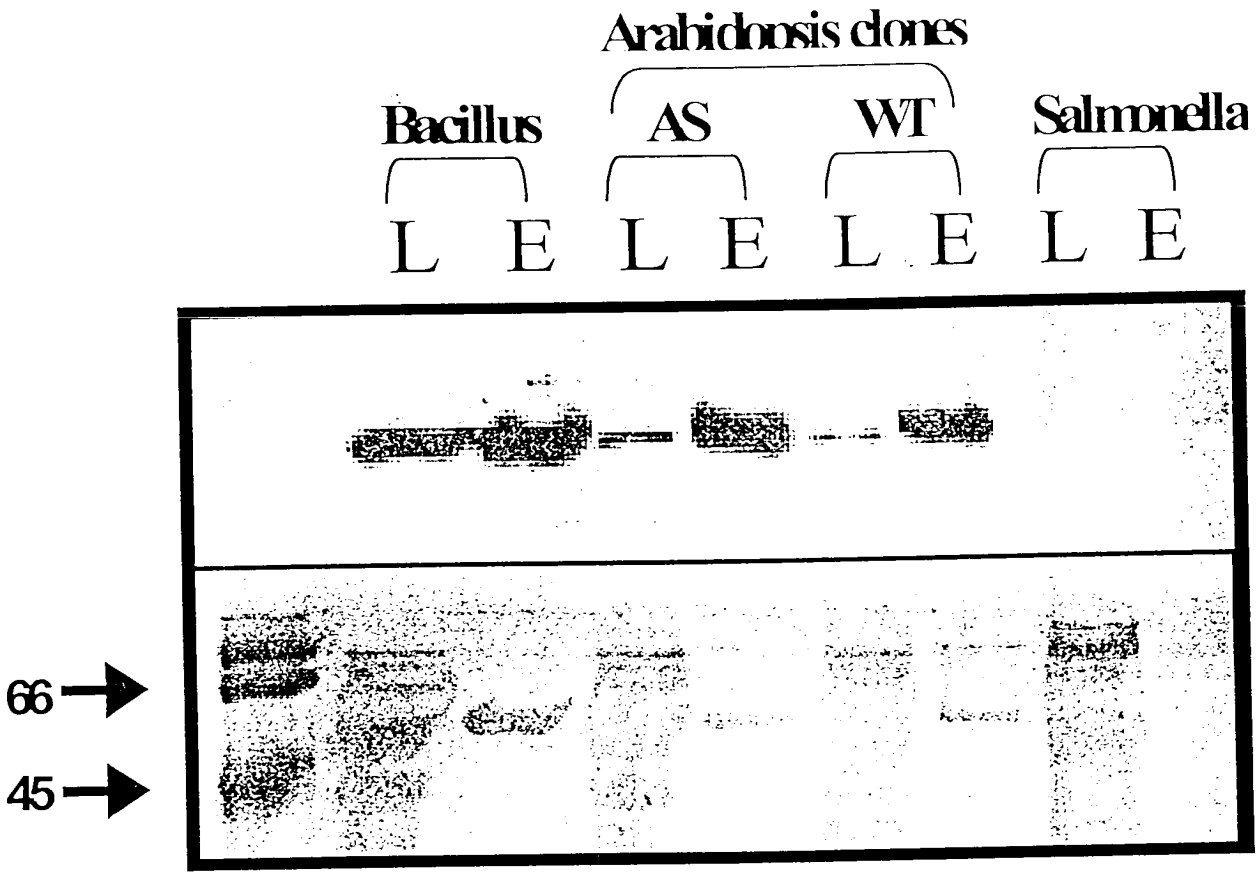
Arabidopsis clones
Bacillus
AS
WT
Salmonella
L E L E L E L E
66
45

FIG. 7